

## **REMARKS**

All the claims submitted for examination in this application have been rejected on substantive grounds. Applicants have amended their claims and respectfully submit that all the claims currently in this application are patentable over the substantive grounds of rejection of record.

The first substantive ground of rejection is directed to Claims 1, 2, 6, 7, 10, 17, 18 and 44. These claims stand rejected, under 35 U.S.C. §102(b), as being anticipated by U.S. Patent No. 5,588,600 to Perfido et al.

The Official Action avers that Figure 1 of Perfido et al. teaches a process for recovering crumb rubber including fiber removal step 5, metal removal step 6, cryogenic cooling step 7, third comminution step 8 and screening step 9. The Official Action argues that these steps occur subsequent to the second comminution step 4. The Official Action further submits that the Perfido et al. patent states that the size of the particles subsequent to the comminution step 4 cannot be greater than  $\frac{1}{4}$  inch in diameter, which encompasses applicants' range of granulated particles, which must be less than 0.0236 inch.

Applicants acknowledge the cordially extended telephone interview with applicants' attorney, Marvin Bressler, by Examiner Rosenbaum on October 30, 2006. During that teleconference the Examiner explained that the steps of fiber removal 5 and ferrous metal removal 6 in the process of the present application occur subsequent to cryogenic contacting step 7. As such, applicants' earlier argument, to the effect that the chilling of the stream of screened used rubber particles occurs prior to cryogenic cooling and is thus outside the scope Perfido et al, is deemed inaccurate.

Applicants' attorney then pointed out that the cryogenic liquid contacting step 7 in Perfido et al. is a second cryogenic liquid contacting step. The earlier argument intended to emphasize that removal of ferrous metal and screening and removal of fiber in the claims of the present application occurred prior to the first cryogenic liquid contacting step and the subsequent grinding step following that cryogenic contact.

In order to coordinate the claims to applicants' earlier argued distinguishing feature from the Perfido et al. process, applicants have amended Claim 1 to introduce the requirement that chilling step (c) is an initial chilling-step. Obviously, the additional term clearly distinguishes the process of the present application from that of Perfido et al. In addition, independent apparatus Claim 17 has been similarly amended to emphasize that chilling means (c) of that claim provides initial cooling of the stream of granulated used rubber particles.

The aforementioned amendments to Claims 1 and 17 add no new matter to the application. The specification and drawings make it abundantly clear that there is only one cryogenic contacting step in the process of the present application. As such, that step, by definition, must be the initial cryogenic fluid contacting step.

To further emphasize this line of distinction applicants have introduced the limitation of Claim 4 into Claim 1. That is, any ambiguity regarding the sequence of processing steps in the process of the broadest claim of the application, Claim 1, is removed by the requirement that the removal of ferrous metal and fiber of screened particles occur subsequent to step (b) but prior to step (c) in Claim 1.

Analogously, the apparatus claims of the present application, as broadly defined in independent Claim 17, have been amended to emphasize that the ferrous metal removal means (a) and the fiber removal means (b) are disposed upstream of the chilling means (c). As such, this further limitation emphasizes the sequence of steps which clearly distinguish over the teaching of Perfido et al.

Insofar as all of the remaining claims of this application ultimately depend from independent Claims 1 or 17, this distinction applies to all the claims of the present application and evidences the novelty of all the claims of the present application over Perfido et al.

It is emphasized that Claim 4, the subject matter of which has been introduced into Claim 1, has been cancelled. Similarly, Claim 5 has been amended to change its dependency from cancelled Claim 4 to Claim 1, which incorporates the limitation of original Claim 4.

The second substantive ground of rejection is directed to Claims 4, 5, 8, 9, 11-16, 20-43 and 45. These claims stand rejected, under 35 U.S.C. §103(a), as being unpatentable over Perfido et al.

The Official Action argues that the limitations of Claims 4, 5, 8, 9, 11-16, 20-43 and 45 would have been obvious design choices insofar as they solve no stated problem.

The above remarks, establishing the requirement that the initial ferrous metal removal step and means and the fiber removal step and means occur prior to and upstream of the step of chilling and grinding steps and means, also provides the predicate for patentability of the claims subject to this second ground of rejection under 35 U.S.C. §103(a).

Applicants submit that the limitation of Claim 4, which has been introduced into Claim 1, evidences the patentability under 35 U.S.C. § 103(a), of all the claims currently in this application. This is so because the requirement that all the claims of the present application include an initial ferrous metal and fiber removal step prior to initial chilling and comminution provide unexpectedly improved results over the prior art teaching of Perfido et al.

This conclusion is predicated upon two important processing improvements provided by the aforementioned amended limitations. The first improvement is the elimination of ferrous metal. This elimination reduces the cooling load in the cryogenic chilling step. Those skilled in the heat transfer arts are aware that a portion of the cooling effect in reducing the temperature of the rubber particles that are subsequently comminuted, is lost to cooling of ferrous particles, which has a far greater heat capacity than does rubber particles. In the present application these ferrous particles are removed prior to cryogenic cooling.

The second important advantage of the claimed process and apparatus of the present application over the teaching of Perfido et al. is that the removal of large ferrous metal and fiber particles is much easier to accomplish than is the removal of these particles after comminution. Those skilled in the art appreciate that larger particles are much easier to remove than are smaller particles. Thus, this step reduces the complexity of the process of the present application compared to that of Perfido et al. Equally important, the smaller particles, produced in the Perfido et al. process, may not be totally removed given the difficulty of that processing step. As such, the crumb and/or powder rubber product produced in the process of the present application is of purer quality than is the product produced in the process of the prior art Perfido et al. process.

Reconsideration and removal of the two substantive grounds of rejection imposed in the present application is deemed appropriate in view of the amendment and remarks above. Such action is respectfully urged.

The above amendment and remarks establish the patentable nature of all the claims currently in this application. Notice of Allowance and passage to issue of these claims, Claims 1, 2, 5-18 and 20-45, is therefore respectfully solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Marvin Bressler", with a long horizontal flourish extending to the right.

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